



When deforestation reaches 20-25% of an area such as Labrea, Amazonas state, Brazil, the system approaches the tipping point to savannah. Photograph: Michael Dantas/AFP/Getty Images

Deforestation

Fossil fuel phase-out will ‘not avert climate breakdown without protections for nature’

Top climate scientist says carbon sinks such as forests and wetlands vital to keeping temperature rise below 1.5C

- **Cop28 summit: live updates**

Fiona Harvey and Patrick Greenfield in Dubai

Mon 11 Dec 2023 06.00 GMT

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Human destruction of nature is pushing the planet to a point of no return, and even a phase-out of fossil fuels will not stave off climate breakdown unless we also protect the natural world, one of the world’s top climate scientists has warned.

Johan Rockström, the director of the Potsdam Institute for Climate Impact Research, told the Guardian: “Even if we phase out all fossil fuels, if we do not get involved in nature, [the destruction of natural landscapes and habitats] can make us lose what we all have agreed on the safe future for humanity on Earth – that is, to stay within the 1.5C limit. It’s really decisive, that we get it right on nature.”

All the scientific models that show a pathway for the world to stay within the crucial temperature threshold of 1.5C above pre-industrial levels make big assumptions about the retention of natural “carbon sinks”, such as forests, wetlands and peatlands, he said. Without these carbon sinks, the excess carbon dioxide in the atmosphere would increase even faster.

Speaking from the Cop28 UN climate summit in Dubai, he pointed to the Amazon, where the rainforest is under unprecedented threat from a combination of logging, rising temperatures and regional drought. Many scientists fear the rainforest could be approaching a “tipping point” whereby the forest could give way to savannah.

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Research had suggested that the Amazon could tolerate as much as 3C of heating before tipping into a savannah-like state, but that did not take account of the impact of deforestation, said Rockström. When the forest is exploited, the “fishbone” pattern of roads encroaching on the trees creates evaporative flow, which dries out the forest. This is likely to mean that when deforestation reaches about 20% to 25% of the area, it combines with high temperatures to bring the system close to the tipping point to savannah.

Currently, he said, deforestation was at about 17%. “So we’re very close to the ecological tipping point,” he warned. “We have a lot of evidence to say that combination of deforestation, biodiversity loss and temperature rise is a very dangerous path to follow.”

Similar forces were at work in the earth’s other big forest systems, in Africa’s Congo basin and in the great forests of south-east Asia, while boreal forest ecosystems are being degraded by bark beetle and wildfires.

Rockström warned: “Once you’ve crossed that point, you cannot go back; you cannot turn back from a savannah state, you cannot kind of just magically conserve the moisture suddenly. This is what one has to understand: that crossing tipping points means points of no return. And we cannot allow that to happen.”

Razan Al Mubarak, the president of the International Union for Conservation of Nature, and a high-level champion at Cop28, said the pressure that natural systems were being put under around the world meant the phase-out of fossil fuels was “absolutely” necessary.

“We need to phase out fossil fuels. But it’s also clear that a fossil fuel phase-out on its own will not keep us safe from the impacts of climate change – we need nature just as much,” she said.

Governments meeting at Cop28 are locked in disagreement over whether to phase out, or phase down, fossil fuels. Draft versions of texts that could be agreed by the fortnight-long conference, which ends on Tuesday, allow for a variety of commitments, or for the deletion of any commitment on fossil fuel use.

More than 100 vulnerable and developing countries, including the world’s small island states, are demanding an unconditional phase-out of fossil fuels. Some rich countries, including in the EU, the UK and the US, have backed weaker language, calling for a phase-out of unabated fossil fuels. Those opposed to a phase-out include big oil producers such as Saudi Arabia and Russia, while some fossil fuel-dependent countries, including India, are demanding fair funding to implement the transition away from coal, oil and gas. China, the world’s biggest emitter, has indicated it may favour some form of compromise, as yet unarticulated.

Rockström has said climate science backs the need for a phase-out of fossil fuels, if the world is stay within 1.5C of heating above pre-industrial levels. He called for governments to agree to protect nature at the same time, in order to give the world a chance of staying within the limit.

“We will have to somehow draw a line here and say that we cannot risk these [natural] systems any more. And the first step to take we’ve talked about is to stop destroying them, protect them. We have to have an agreement on keeping the remaining intact nature intact,” he said.

Rockström said scientists were increasingly concerned by what they were observing in the world's forests and other natural ecosystems. He said: "The climate models that give us a remaining carbon budget for an orderly phase out of oil, coal and gas have assumed that nature will not surprise us. And now nature is surprising us so of course that makes us very worried."

Razan called on the governments meeting in Dubai to pay more attention to the warnings they were hearing from Indigenous peoples around the world, who are witnessing the vast changes going on in their home regions.

"What science has been saying is exactly also what Indigenous knowledge has been saying, and Indigenous peoples have been at the forefront of all of this," she said. "They're also saying that there is a need to re-evaluate our relationship with nature."